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June 20, 1996

Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street
Washington, D.C. 20554

RECEIVED
JUN 20 1996
FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

Re: CC Docket No. 95-185
NOTICE OF ORAL EX PARTE PRESENTATION

Dear Mr. Caton:

On this date, Alexander Netchvolodoff and Alexandra Wilson of Cox Enterprises, Inc. ("Cox") and the undersigned met with Michele Farquhar, Chief of the Wireless Telecommunications Bureau regarding the above-referenced proceeding. During that meeting, we discussed the issues described in the attached presentation materials, which were provided to Ms. Farquhar.

In accordance with the requirements Section 1.1206(a) of the Commission's Rules, an original and one copy of this letter are being submitted to the Secretary's office, and a copy is being provided to Ms. Farquhar.

Respectfully submitted,


J.G. Harrington

JGH/veh

cc (w/o attach.): Michele C. Farquhar, Esq.

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COX COMMUNICATIONS, INC.

June 20, 1996

RECEIVED

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**FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY**

In the wake of the 1993 decision by Congress to federalize CMRS, the Wireless Bureau was given birth at the FCC. The period from 1990 to 1993 saw an unprecedented expansion and maturation of the industry. Having moved from infancy to adolescence in a mere decade, CMRS now stands at the threshold of status as a full-fledged telecommunications player. With the advent of PCS, the industry is on the verge of offering a wide range of competitive services and functionalities on a national basis. Indeed, the promise of these national services lay at the very heart of the Congressional decision to grant the Commission jurisdiction over CMRS. Unlike wireline telephony services, the fabric of interconnected radio cells in multistate jurisdictions interoperating solely on the basis of signal strength -- not geographic location -- makes the wireline regulatory distinctions of intrastate vs. interstate traffic unworkable. Moreover, the consolidation of cellular licenses and the allocation of PCS licenses means that industry players now function on a regional basis.

The attached material is submitted to the Wireless Bureau to assist it in its work in the CMRS to LEC interconnection docket. The material summarizes the record about reciprocal compensation costs, relevant actions taken by the states, the irrelevance of peak period arguments, the suitability of interim bill and keep and the remedies against arbitrage.

June 20, 1996

Cox Communications, Inc.

PRICING OF CMRS-LEC RECIPROCAL COMPENSATION ARRANGEMENTS

1. Permanent transport and termination rates for the mutual exchange of traffic between wireless and wireline networks should not include any overhead loadings, joint and common costs or other "contributions", but rather should be based on forward-looking Long Run Incremental Cost (LRIC).

- LRIC is the most pro-competitive public policy option
- even LEC economists agree that this intermediate input should not include loadings or contributions (see Comments of SWB Mobile)
- use of LRIC would be consistent with the pricing signal in Section 252(d)(2) of 1996 Act for LEC-LEC reciprocal compensation arrangements
- LRIC is more appropriate than TSLRIC for this purpose (see Tab 1)

2. The record before the Commission demonstrates that the LRIC of transporting and terminating an additional minute of traffic on a LEC network is extremely small -- on average, roughly .2 cents per minute. (See Tab 2)

- figure is a blended rate -- i.e., it combines the different rates for end office termination and tandem switch termination according to the relative percentage of each that is typically used for a local call
- figure is confirmed by a variety of studies, including a number of cost studies conducted by, or on behalf of, LECs
- claims that the number should be higher are either not supported by any data or are not limited to LRIC because they include some contribution to shared, common or embedded costs

3. More than half of the states that have addressed LEC-LEC reciprocal compensation have adopted bill and keep on an interim basis. The remaining states have chosen, contrary to Section 252(d)(2), to include some level of contribution in reciprocal compensation rates. Yet even these states typically have set rates that are well under 1 cent per minute. (See Tab 3)

4. Transport and termination costs are fixed capacity costs, not variable costs that fluctuate on a usage-sensitive basis. The only relevant question is whether the network terminating the call has sufficient capacity to do so during its busiest hour. (See Tab 4)

- the average LRIC of terminating an additional minute of traffic does not change no matter how long the peak period lasts; rather, the cost during the peak period on a per minute basis is simply lower the longer the peak lasts

- CMRS/LEC peaks do not overlap, but even if they did, LEC networks are unlikely to experience a capacity problem for the foreseeable future

5. The LRIC of adding an additional minute of capacity is significantly higher than average during the peak, or busy, hour of the network, and is zero during the off-peak, or non-busy, hours. Setting up a peak-load pricing scheme, however, is an unattractive alternative for regulators because it adversely influences behavior as users try to avoid peak pricing.

6. The only operational PCS operator to date, APC, is experiencing a roughly balanced traffic flow with Bell Atlantic in the Washington-Baltimore MTA. In New York (one of the few states with some experience in local exchange competition), MFS reportedly terminates more traffic than it receives from incumbent LECs.

7. Bill and keep is economically efficient where either (1) traffic is approximately balanced or (2) the costs of transporting and terminating traffic are de minimis when offset by the administrative costs of measuring and billing for traffic.

- in the case of digital PCS services, the first condition is likely to be met
- in the case of all CMRS-LEC interconnection, the second condition is almost certainly satisfied

8. Accordingly, the best public policy outcome is to impose bill and keep on an interim basis for use as the default during CMRS-LEC interconnection negotiations. A carrier who can demonstrate, on the basis of hard traffic data from the interim period, that it is likely to have excess inbound traffic would be able to submit a LRIC study to the regulator and recover the costs supported by that study. Bill and keep would be imposed on a permanent basis only where (1) a carrier with excess inbound traffic decides not to submit a LRIC study, or (2) such a carrier submits an inadequate study and the regulator is unable to identify accurately its long-run incremental costs.

- eliminates the need for the FCC to determine LRIC with precision for all carriers, since only those carriers with more than de minimis costs will present a case for review
- provides appropriate incentives to negotiating parties and prevents incumbent LECs from exerting undue bargaining power

9. The possibility of "arbitrage" is a red herring and must not be used to avoid the implementation of fair, rational and cost-based rates for CMRS-LEC reciprocal compensation. (See Tab 5)

- because there has always been a range of rates that apply to different types of "interconnection," the potential for arbitrage has existed for years and has long been managed satisfactorily by regulators

- recent reciprocal compensation arrangements between CLECs and ILECs reveal that the parties have more than adequate means of protecting themselves against arbitrage

TAB 1

GLOSSARY OF ECONOMIC TERMS

Long run — A period of time of sufficient length that all inputs can be varied and none is fixed.

Incremental cost — The cost ascribable to any specified change in volume of output or service. Incremental cost is affected by the baseline mix of services; the definition of the increment; and the time frame examined.

Forward-looking costs — Costs based on the options available to the firm at the time they are incurred and which do not account for sunk expenditures.

Embedded costs — Costs that take into account expenditures made in the past.

Long run incremental cost ("LRIC") — The forward-looking cost of any specified change in volume of output or service in the long run. This term should be used in the context of a specific existing output or service. LRIC does not include any overheads. For instance, the cost of adding additional capacity for transport and termination to a carrier's existing capacity for that functionality can be calculated on a LRIC basis. Use of LRIC as a costing standard is appropriate when a firm must recover the additional costs associated with providing specific capacity.

Total service long run incremental cost ("TSLRIC") — The forward-looking cost of adding an entire service to the services offered by a firm in the long run. TSLRIC includes overheads or common costs associated with the service, but does not include general overheads of the firm. For instance, the cost of providing local telephone service can be calculated on a TSLRIC basis. TSLRIC would be an appropriate costing standard when a firm is permitted to recover its reasonable forward-looking costs of providing a product or service.

Fully distributed costs ("FDC") — Costs calculated using a system of cost assignment in which all costs recorded in the books of account, including sunk investment and general overheads, are allocated among products and services, or combinations of categories of products and services. FDC is an embedded cost methodology. Use of FDC as a costing standard is appropriate when a firm is permitted to recover all of the costs it has incurred to provide a product or service.

TAB 2

REVIEW OF RECORD ON LEC LOCAL TRANSPORT AND TERMINATION COSTS FINDINGS FROM LEC COST STUDIES

Because Competitive Access Providers ("CAPs") over the last several years have petitioned various state commissions to allow local exchange competition, a number of states, even before the passage of the 1996 Act, began to analyze the cost characteristics and technical arrangements for the exchange of traffic between competitive local carriers. More than half of the states that have examined the issue have adopted bill and keep as the most reasonable reciprocal compensation method on an interim basis, pending demonstration by the incumbent LEC of its incremental costs of providing reciprocal transport and termination. While a number of states have ordered LECs to perform incremental cost studies, many of these are still currently underway. Several other states have picked an interim LEC compensation figure pending completion of reliable incremental cost studies or demonstration by the LEC that it suffers from a significant traffic imbalance.

Additionally, the Federal Communications Commission, in both the CMRS-LEC interconnection docket and in the 1996 Act Implementation docket, has sought concrete information regarding incumbent LEC incremental costs of reciprocal transport and termination. The evidence both at the FCC and the states demonstrates that LEC costs are a tiny fraction of the one-way rates typically charged to CMRS providers for transport and call termination. This section summarizes everything placed in the FCC's CMRS and 1996 Act Interconnection record and evaluates the information LECs and other commenters have offered on LEC transport and termination costs.

Reliable Cost Studies

Because the LECs control the data on additional cost, if any, imposed by the reciprocal transport and termination of a CMRS carrier's traffic and because the status quo heavily benefits the LECs, they have no incentive to provide the FCC with usable cost studies. Accordingly, while many of the available cost studies rely on LEC data, those filed with the FCC are not developed or presented by the LECs. Nonetheless, these studies make one thing clear — the LECs' incremental transport and termination costs are tiny, on the order of roughly 0.2 cent per minute. Higher cost estimates are either unsupported by any evidence or include other allocations or contributions.

The first survey placed in the CMRS interconnection docket record of LEC incremental costs was authored by Dr. Gerald W. Brock ("Brock") on behalf of Cox.^{1/} In this paper, Brock reviewed existing, publicly available studies and concluded that the incremental cost of local usage (the cost of terminating traffic from a competitor) is, on

^{1/} "The Incremental Cost of Local Usage", filed in CC Docket No. 94-54, March 21, 1995.

average, approximately 0.2 cents per minute.^{2/} Brock relied upon the most comprehensive public engineering study of incremental costs performed by an Incremental Cost Task Force ("Task Force"), a group with members from GTE, Pacific Bell, the California Public Utilities Commission and the RAND Corporation.^{3/} The Task Force used California LEC data on switch investment, switch maintenance, interoffice transport and call attempt costs to compute LEC incremental costs for calls during the busiest hour of the year, because the investment and associated expenses are entirely related to *capacity* cost.^{4/} Taking the reported results of the Task Force, Brock demonstrated a per minute average range of 0.13 cents to 0.25 cents, or approximately 0.2 cents per minute.

As confirmation of the reasonableness of the 0.2 cent figure, Brock also cited a New England Telephone engineering study prepared at the direction of the Massachusetts PUC that determined an incremental cost of 0.2 cents per minute for local usage, the same conclusion reached by the Incremental Cost Task Force using California LEC data.^{5/} Brock also reviewed an econometric cost study that examined the statistical relationship between the total cost of individual LECs and the access lines, local usage and toll usage of these companies. The study used four alternative models that yielded estimated marginal costs for local minutes ranging from 0.2 cents per minute to 1.3 cents.^{6/} Brock observed that the statistical form used in the study generates marginal cost numbers approximately equal to average cost numbers, and that therefore it would be anticipated that econometric estimates would be somewhat higher than engineering estimates of incremental cost. Another reason Brock cited for higher marginal cost results was the econometric study's use of the cost of embedded analog switch technology rather than the digital switching technology used by the Task Force. He thus concluded that the best estimate of the forward-looking long run incremental cost of call termination is 0.2 cents per minute, on average.

2/ Brock also concluded that the actual cost would be considerably higher during the peak period and zero during the off-peak period.

3/ See Bridger M. Mitchell, Incremental Costs of Telephone Access and Local Use, Santa Monica, CA: The Rand Corporation, 1990); also reprinted in William Pollard, ed., Marginal Cost Techniques for Telephone Services: Symposium Proceedings (Columbus, Ohio: National Regulatory Research Institute, 1991 (NRRI 91-6)).

4/ The Task Force study included a mix of both direct and interoffice switching according to the relevant percentage of each that is typically used to make and complete local calls.

5/ Reported in Lewis J. Perl and Jonathan Falk, "The Use of Econometric Analysis in Estimating Marginal Cost," NERA Report, April 6, 1989.

6/ NERA Report at Table 2.

In the FCC's ongoing 1996 Act Implementation Proceeding, much of the focus on the pricing/cost standards of Section 252 has been on the relevant costs for unbundled network elements. While the pricing/cost standard for unbundled elements under Section 252(d)(1) is different from and higher than the "additional cost" standard in Section 252(d)(2) for the transport and termination of traffic by local competitors, evidence has been introduced by AT&T and MCI about the LECs' "Total Service" Long Run Incremental Cost (TSLRIC) that further demonstrates that incumbent LECs' costs of providing unbundled local services or switching functions are very, very low.^{7/}

The Hatfield study provides a numeric "upper bound" TSLRIC of eleven identified Basic Network Functions ("BNFs") used to provide narrowband local telephone services. The input data used to derive this latest version of the Hatfield model is LEC 1995 ARMIS data.^{8/} These numbers provide a TSLRIC benchmark reference for each state against which current incumbent LEC charges to competitors might be judged. The TSLRIC costs of end office switching range from a high of 0.39 cents per minute in Nebraska to a low of 0.17 cents per minute in Maryland.^{9/} The Nebraska figure was identified as an aberration, and most state switching costs are clustered around 0.2 cents per minute.

In some isolated cases incumbent LECs have presented record evidence of incremental costs (usually to establish a price floor on which to add common costs, overheads and other cost contributions). In Massachusetts, for example, cost data provided by a NYNEX witness in a proceeding examining the pricing of unbundled elements and interconnection arrangements for competitive LECs shows a blended cost of 0.23 cents per minute for termination at end offices and tandems during peak periods.^{10/}

In establishing the ground rules for competitive wireline interconnection in Florida, the Florida PSC staff reviewed underlying local service cost support data filed by both GTE and

^{7/} See Reply Comments of AT&T, Appendix D, "Update of the Hatfield Model," Version 2.2, Release 1, CC Docket 96-98, May 30, 1996 ("Hatfield Model"). As Cox explained in its comments in the 1996 Act Interconnection Implementation, TSLRIC figures are generally higher than LRIC figures.

^{8/} Hatfield Model at 2.

^{9/} The Hatfield model notes that several LEC data points need further input and verification by LECs. Hatfield singles out U S West's data for Nebraska as an example of potentially misleading data.

^{10/} See Testimony of Paula L. Brown, Managing Director, NYNEX Corporation, in Massachusetts DPU Docket No. 93-125, June 14, 1993 at Workpaper 4, Attachment 3. The reported end office termination rate was 0.13 cent per minute.

Centel/United.^{11/} GTE's witness agreed that the Company's cost for terminating a local call was less than 0.2 cent per minute of use.^{12/} After review of the proprietary LEC data, the staff concluded that a reciprocal compensation rate of 0.25 cents per minute was appropriate for GTEFL as it covered:

estimated TSLRIC cost for end office switching and the LRIC for tandem switching and transport components. While staff understands that GTEFL's costs are a combination of estimated TSLRIC and LRIC costs, staff believes that this rate level would be sufficient to cover the greater of TSLRIC or LRIC in addition to possibly providing some contribution to common costs.^{13/}

The staff rejected the Centel/United termination costs estimate of between 0.5 and 0.75 cents per minute for tandem termination based on a number of uncertainties the staff identified in the cost information provided by Centel/United.^{14/} The staff also observed that the Centel/United costs were not consistent with either GTE's or the similar 0.25 cent per minute estimate provided by BellSouth in an earlier proceeding.^{15/} Notably, after reviewing the staff's cost analyses, the full Florida Commission concluded that bill and keep was the best reciprocal compensation arrangement for both GTE and Centel/United.

11/ The cost calculation included technology specific investments weighted by the percent technology mix in the state and state and account specific factors were applied to the equipment investment to account for labor costs. Account specific annual cost factors for items such as return on investment, depreciation, maintenance/repair, customer operations and taxes were applied to total investment to determine the operating expenses and to generate annual costs. Order at 11.

12/ This stated cost included the LRIC for tandem switching and transport and an estimate of the TSLRIC for end office switching. The staff noted that while these figures did not expressly include a contribution to joint and common cost, the GTE witness stated that a return on GTE's capital investment was included.

13/ Florida Docket No. 950985-TP, April 5, 1996 at 11-12.

14/ The Florida PSC staff also observed that proprietary cost information testimony revealed that developing a local measurement and billing system could more than double the total service long run incremental cost of the switching function for terminating traffic from the cost without measurement and billing. The staff concluded that "there appears to be consistency between the parties that there is a significant expense to measuring local terminating traffic." Florida PSC Docket No. 950985-TP, April 5, 1996 at 21.

15/ See Bell South Docket No. PSC-96-0445-FOF-TP (released March 29, 1996).

Other Cost Studies

Despite the fact that they alone have access to information about their own costs, the LECs in the CMRS docket have offered just two, completely unsupported numbers as their "cost" of providing reciprocal termination that cannot be relied upon either as reasonable incremental cost estimates or as cost proxies. Pacific Bell, for example, disputed the Brock 0.2 cent cost estimate and stated that its:

LRIC for terminating wireless service is in the range of 0.5 cent to 1.0 cent per minute, while peak costs for termination are approximately five times this amount. These LRIC estimates, of course, do not include shared and common costs that we must have the opportunity to recover.^{16/}

Pacific Bell offered no engineering or econometric studies that the FCC or interested parties might use to verify these unsupported cost assertions — even though they are significantly higher than the many, verified cost estimates discussed above.

Similarly, in its comments in the CMRS docket, the United States Telephone Association ("USTA"), through its consultants, claimed a cost of 1.3 cents per minute "on average" for "switched access costs."^{17/} There are several obvious problems with this figure. First, the data that USTA's consultants "examined" apparently derived from a widely criticized 1993 study by the same authors that claimed a \$20 billion annual LEC universal service subsidy and from the same flawed econometric cost study referenced in the Brock Incremental Cost Paper.^{18/} Second, the USTA Analysis admittedly reclassified as incremental costs some costs that are normally viewed as overhead costs in engineering studies, leading to a higher incremental cost result. Finally, the deliberate use of a switched access average figure is misleading. As Brock observed in the Cox Incremental Cost Paper when he reviewed the same econometric study that appears to underlie the USTA Analysis, the statistical form used in the study generates marginal costs approximately equal to average costs, resulting in higher cost results than those obtained in an engineering study. It also uses embedded analog switching costs, rather than the costs of more modern digital switches. And, the USTA Analysis does not report the range of results from the NERA econometric study of

^{16/} Pacific Bell Comments in Docket No. 95-185 at 55.

^{17/} See "Bill and Keep: A Bad Solution to a Non-Problem" by Jeffrey H. Rohlfs, Harry M. Shooshan III, and Calvin S. Monson of Strategic Policy Research, filed as an attachment to USTA Comments on March 4, 1996 at 9 ("USTA Analysis").

^{18/} The USTA Analysis states that the authors "found evidence that switched access costs are \$0.013 per minute on average" and "relied on published econometric analyses of LEC reported costs data" that "measure as incremental costs some of what engineering studies often classify as overhead". *Id.*

between 0.2 to 1.3 cents on average, but rather simply picks the highest number. For these reasons, the USTA 1.3 cent figure is not a reasonable cost estimate.

Several states have determined, for their own reasons, that incremental cost interconnection could adversely affect local telephone rates and have chosen to permit LECs to charge rates admittedly in excess of their incremental cost.^{19/} Review of these state decisions demonstrates that claimed LEC "cost" figures of 0.6 cents or more do not represent incremental costs, but cost-plus overhead, common costs and other unidentified subsidies.

For example, the Maryland PSC examined Bell Atlantic's proprietary cost data and rejected Bell Atlantic's estimates of its transport and termination costs. The PSC stated in its Order that:

the most developed, specific interconnection rate proposal from a party other than Bell Atlantic is presented by [the Maryland Staff witness]. In his direct testimony, he calculates a per minute termination cost of BA-MD of 0.6 cents per minute, inclusive of direct, shared, common costs, and contribution. . . . Employing the same methodology used to determine tandem interconnection costs [the Maryland staff witness] arrives at a maximum end office interconnection rate of 0.4 cents/MOU. Order at 29-30.

The PSC noted that the PSC staff witness revised his estimate following Bell Atlantic's argument that interconnection rates should be different depending upon end office or tandem termination. Using BA-MD's proprietary costs, the PSC described the Staff witness's calculation on rebuttal as first calculating:

the total direct and shared costs of terminating a call at a tandem, then mark[ing] up that sum by 16 percent to reflect contribution to BA-MD's common costs. He states this level of mark-up reflects [BA-MD's witness's] testimony that common costs represent 16 percent of Bell Atlantic's total direct and shared costs. The calculation of direct, shared and common costs is less than half of his proposed rate for tandem interconnection of 0.6 cents/MOU. Therefore he notes that his proposed 0.6 cents/MOU tandem interconnection rate contains substantial additional contribution to BA-MD's common costs, and that the rate should be considered the maximum rate the Commission should consider. *Id.* (emphasis supplied)

In essence, the staff witness found that Bell Atlantic's costs, even including an allocation of shared and common costs, were less than 0.3 cents per minute for tandem termination (*i.e.*, less than one-half of 0.6 cents per minute). Nonetheless, the Maryland PSC determined that it

^{19/} As described in detail in Cox's comments in the 1996 Act Interconnection Proceeding, Section 252(d)(2) precludes the inclusion of any costs above and beyond the "additional," or incremental, cost of transporting and terminating traffic on the LEC network.

was appropriate to set reciprocal interconnection rates at levels that allowed Bell Atlantic to recover its direct, joint and common costs. The PSC adopted a rate of 0.5 cents per minute of use for tandem interconnection and 0.3 cents minute of use for end office interconnection.^{20/}

In a similar vein, last year the Illinois Commerce Commission examined the issue of reciprocal compensation and concluded that simply eliminating the residual interconnection charge from intrastate access would be insufficient. Disagreeing with the cost arguments of new entrants, however, the Commission agreed with a recommendation by its staff that the reciprocal charge should contain "an identifiable contribution level."^{21/} In setting rate levels the staff relied upon Illinois Bell to perform a series of studies on possible termination rates that contained a number of different contribution levels. Based on these results, the staff developed recommended rates of both end office and tandem switched termination of 0.75 cents per minute for tandem and 0.5 cents per minute for end office termination. Explicitly included in the rate structure "is an element for recovering 'contribution' over and above the LRSICs directly attributable to termination." Id.

^{20/} Order No. 72348, released December 28, 1995 at 32. The PSC also approved in theory but deferred implementing a capacity charge that Teleport Communications Group had presented as a more efficient interconnection option.

^{21/} Illinois Order at 85.

TAB 3

**SYNOPSIS OF STATE PUC ORDERS CONCERNING
RECIPROCAL COMPENSATION RATES**

A growing number of states have adopted policies on reciprocal landline termination rates. In the absence of credible cost information from incumbent LECs, many states have opted for interim bill and keep arrangements as the most pro-competitive interim reciprocal compensation arrangements. This section lists the states that have embraced bill and keep as an interim compensation mechanism as well as the states that have forged other interim compensation solutions.

States Adopting Interim Bill and Keep

STATE	SYNOPSIS
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Arizona	The Corporation Commission has adopted rules for the mutual exchange of traffic on an interim bill and keep basis. If after the interim rules have been in effect for 24 months, parties have not reached mutual agreements, the rules permit the filing of tariffs proposing non-usage sensitive permanent compensation arrangements.
California	The Public Utility Commission has required the use of bill and keep on an interim basis for one year. Permanent rates will be set after review of LEC cost studies.
Connecticut	The Department of Public Utility Control has required the use of bill and keep for 18 months, followed by negotiated cost-based rates.
Florida	The Florida Commission adopted bill and keep as the preferred reciprocal compensation method. Carriers can file tariffs to recover costs if traffic proves to be significantly out of balance.
Iowa	The Utilities Board has required the use of bill and keep on an interim basis pending approval of cost-based tariffs.
Michigan	The Public Service Commission has required on an interim basis a usage based charge of 1.5 cents per minute with bill and keep in effect if the traffic volume of the two carriers is within 5 percent of each other. GTE and Ameritech have until August 5, 1996 to file local traffic termination TSLRIC studies.
Oregon	The Public Utility Commission has required the use of bill and keep on an interim basis for up to two years.

Texas	The Public Utility Commission implemented rules requiring bill and keep for nine months after new carrier entry.
Washington	The Commission has required the use of bill and keep until number portability is implemented and other barriers are removed, followed by negotiated rates that reflect the manner in which costs are caused (i.e. primarily non-traffic sensitive). The Commission has ordered both GTE and U S West to file cost studies for capacity-based local interconnection charges by July 1, 1996.
Wisconsin	Very recently adopted interim bill and keep with the possibility of long term bill and keep if traffic proves to be reasonably balanced. The Commission's order has not yet been released.

States Adopting Other Compensation Mechanisms

STATE	SYNOPSIS
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Hawaii	Permits bill and keep, but leaves compensation arrangements to intercarrier negotiation.
Illinois	The Commerce Commission has required a usage-based charge of 0.5 cents per minute for end office and 0.75 cents per minute for tandem. These figures include common costs and contributions.
Ohio	Ohio favors negotiated arrangements and allows carriers to recover their incremental costs of termination, plus an allocation of joint and common costs. All interim interconnection arrangements that adopt bill and keep for a year will be permitted as <i>per se</i> reasonable.
Pennsylvania	The Public Utilities Commission has required all carriers to pay into an escrow account pending adoption of cost-based rates.
New York	The Public Service Commission has established a framework in which CLECs pay compensation rates for terminating calls at a rate roughly half of the retail rate to create an imputation safeguard and avoid price squeezes.
Maryland	The Public Service Commission has required a usage based charge of .3 cents per minute for end office termination and .5 cents per minute for tandem termination. These figures include common costs and contributions.
Massachusetts	The DPU tentatively set termination charges at .015 cents per minute but will revisit the compensation issue when the FCC completes its interconnection proceeding.

TAB 4

PEAK/OFF-PEAK ISSUES

Determination of the Costs of Transporting and Terminating Local Traffic

Dr. Gerald Brock, in his paper on the incremental costs of transporting and terminating local traffic, has demonstrated that the cost of termination is approximately 2.1 cents per minute during the busy hour, is 0.0 cents per minute during the non-busy hours and is approximately 0.19 cents per minute on average.^{1/} Dr. Brock derived these figures from data compiled by the Rand Corporation as part of the Incremental Cost Task Force, which determined the incremental costs of the functions necessary to complete a telephone call using California LEC data on switch investment, switch maintenance, interoffice transport and the costs of call attempts.^{2/} The cost per minute of call termination is calculated by adding the total costs of functions unrelated to call attempts (which averaged \$8.50 per year per busy hour per hundred call seconds) and the costs of call attempts during the busy hour (which averaged \$0.75 per year per busy hour per hundred call seconds), and converting those costs to a per minute amount based on the number of call minutes per year.^{3/} The result of that calculation was 0.19 cents per minute.

One key element of Dr. Brock's calculations is that all costs are computed on a capacity basis. That is, each cost is the cost of providing the total capacity for that function necessary to handle the traffic expected during the busy hour. Thus, switch investment is the total investment in switching necessary to support the busy hour. Similarly, switch maintenance is the total cost of maintaining the switching capacity necessary to support the busy hour, and does not vary depending on the total number of calls handled by the network.

As discussed at Tab 2, the results of the Brock study are consistent with a variety of other determinations of the costs of call termination. For instance, cost data presented by

^{1/} "The Incremental Cost of Local Usage," filed in CC Docket No. 94-54, March 21, 1995.

^{2/} See Bridger M. Mitchell, Incremental Costs of Telephone Access and Local Use, (Santa Monica, CA: The Rand Corporation, 1990 (the "Rand Study"); also reprinted in William Pollard, ed., Marginal Cost Techniques for Telephone Services: Symposium Proceedings (Columbus, Ohio: National Regulatory Research Institute, 1991) (NRRI 91-6).

^{3/} The number of call minutes per year was calculated by dividing the total number of hours in the year (8,766) by the ratio of usage during the peak hour in a day to usage during the average hour (approximately 3) and multiplying the result by the number of minutes in one hundred call seconds (100/60 or 1.67). The result of this calculation is 4,880. The ratio of peak to average usage used in these calculations is confirmed by empirical data such as that provided in BellSouth's March 20, 1996 *ex parte* in this docket..

NYNEX in a Massachusetts proceeding considering the appropriate pricing for interconnection for competitive LECs shows a blended cost for transport and termination of approximately 0.23 cents per minute, and the Florida Public Service Commission staff found that the cost of terminating a local call was less than 0.2 cents per minute.^{4/} Indeed, a nationwide study of termination costs found that the TSLRIC costs of end office switching typically are in a range between 0.15 and 0.3 cents per minute.^{5/}

The Existence of Multiple "Busy Hours" Does Not Affect the Average Cost of Terminating Traffic

Some LECs have suggested they have multiple "busy hours" during a day and that, therefore, the average cost of terminating CMRS traffic is higher than demonstrated by the Brock study and other empirical determinations of the costs of termination. Basic mathematics demonstrates that these suggestions are incorrect.

As shown above, the costs of termination are determined by the capacity needed to provide service during the busiest hour of the day. None of the costs are dependent on the number of minutes of use during any other hour. Only the busiest hour matters because it is traffic during that hour that determines the maximum capacity required by the network and, therefore, the costs of providing that capacity. Even if there were six hours in the day with exactly the same level of traffic, the number of hours that had "busy hour" levels of traffic would not affect the capacity needed and therefore would not affect the costs of termination.

It could be argued that it would be appropriate to spread the busy hour costs over the group of busiest hours to assure that those costs are recovered. Doing so does not affect the

4/ See Testimony of Paula L. Brown, Managing Director, NYNEX Corporation, in Massachusetts DPU Docket No. 93-125, June 14, 1993, at Workpapers 2-3, Attachment 3; Florida Docket No. 950985-TP, April 5, 1996 at 11-12. Ms. Brown's testimony calculates the costs for NYNEX to complete a call on its own network and, consequently, double-counts certain cost elements (specifically end office switching, fiber termination and "other termination") that are implicated only once in transport and termination of a call received from another carrier's network. Eliminating these costs and including the costs of tandem switching in the calculations for interoffice calls yields a cost for transporting and terminating intraoffice calls of 0.13 cents per minute, a cost for transporting and terminating interoffice calls of 0.38 cents per minute and a blended cost (using NYNEX's methodology, as shown on Workpaper 3 of Ms. Brown's testimony) of 0.23 cents per minute.

5/ See Reply Comments of AT&T, Appendix D, "Update of the Hatfield Model," Version 2.2, Release 1, CC Docket No. 96098, May 30, 1996.

average cost of termination, however, because the total cost and the total number of hours over which that cost is averaged do not change. Using Dr. Brock's calculations, for instance, where there is one busy hour, the cost during that busy hour is 2.1 cents per minute and the average cost during a 24 hour period is 0.19 cents. If there are six "busy hours," then the cost during each busy hour is 0.35 cents and the average cost during the 24 hour period is still 0.19 cents. Because the total costs are based on maximum capacity, it does not matter how many hours are in the busy period.^{6/}

The Record Evidence Shows that CMRS and Landline Peaks Do Not Overlap

Given the capacity-related nature of the costs of interconnection, it follows that an interconnector imposes costs on another carrier only to the extent that it increases the peak capacity requirements of that carrier. If the peaks of the two carriers do not overlap, then it is unlikely that there are any meaningful additional costs for the landline carrier.

Some commenters have suggested that the peaks for CMRS and landline traffic overlap, but the evidence shows otherwise. For instance, data provided to the Commission by BellSouth in a March 20, 1996 *ex parte* submission shows that the two busiest hours for landline traffic occur from 10:00 to 11:00 a.m. and from 11:00 a.m. to 12:00 noon, while the two busiest hours for cellular traffic occur from 4:00 to 5:00 p.m. and from 5:00 to 6:00 p.m.^{7/} Ironically, BellSouth uses this very data to argue that there is an overlap between the peaks, based on traffic levels at hours other than the busiest hours. This argument misunderstands the nature of interconnection costs. As shown above, these costs are capacity costs and, therefore, are affected only by the traffic level in the busiest hour. Traffic levels in the third, fourth or fifth busiest hours have no effect on the cost of providing the

^{6/} The mathematical relationship can be described in this way: $m = [(c/b + v) * b] / 24$, where m is the average cost, c is the capacity cost, b is the number of busy hours, and v is costs that are incurred separately for each busy hour. (All costs are expressed on a per minute basis.) Where all costs are dependent on capacity (c) and there are no costs incurred separately for each busy hour (v), then the average cost per minute is unaffected by the number of busy hours. Moreover, if there are multiple "busy hours," the peak cost per minute is reduced because the total capacity cost is spread over a larger base. Using the Brock data, c is 2.1 cents and b is 1 (*i.e.*, there is a single busy hour), which creates a peak cost of 2.1 cents and an average cost of 0.19 cents. If there were six "busy hours" in a day, b would be 6. This would create a peak cost of 0.35 cents ($2.1/6$) and an average cost of 0.19 cents ($[(2.1/6 + 0) * 6] / 24$), which is the same average cost as with a single busy hour.

^{7/} A chart reproducing the BellSouth data and showing the peak traffic periods for cellular and landline traffic is attached. All data in the chart is taken directly from the BellSouth March 20 *ex parte* filing.

maximum capacity required to operate the network; the capacity requirement is determined solely by the amount of traffic carried in the busiest hour.^{8/}

If CMRS and landline peaks do not overlap, then terminating CMRS traffic imposes no additional cost on landline carriers because CMRS traffic does not affect the capacity needed to handle peak traffic. Even if CMRS and landline peaks did overlap, that would not change the nature of the costs involved, which are capacity costs, or affect the Brock study calculations of the extent of the cost for each additional minute of peak capacity. As shown above, those costs would be approximately 0.2 cents per minute, averaged over all minutes. Moreover, incumbent LECs generally have spare capacity in their networks, so the actual additional cost of transport and termination could be zero.

^{8/} GTE has submitted a graph that it claims shows overlapping landline and CMRS peaks with its April 25, 1996 *ex parte*, but the data used to produce that graph are suspect. First, GTE collected data for only one week and does not disclose the week it used. (There could be significant differences between, for instance, a week with a holiday in it and other weeks in the year.) Second, GTE states that it aggregated *all* wireless traffic, including paging. Thus, it is impossible to apply GTE's calculations to two-way services, which easily could have different usage patterns.

**Wireline versus Outgoing Cellular Call Distribution and Minutes of Use Distribution
(Weekday Calls/Minutes by Hour)**

[Data as provided in BellSouth March 20, 1996 Submission]

TIME OF DAY	WIRELINE			CELLULAR			COMMENTS
Beginning Hour	% of Total Calls This Hour	% of Total Minutes This Hour	Average Minutes/Call	% of Total Calls This Hour	% of Total Minutes This Hour	Average Minutes/Call	Peak wireline usage and peak cellular usage do not overlap.
8:00 am	5.28%	5.05%	2.94	4.25%	3.89%	1.99	
9:00 am	7.81%	7.78%	3.07	6.02%	6.10%	2.20	
10:00 am	8.74%	8.49%	2.99	7.14%	7.55%	2.29	← Wireline peak call volume and peak minutes.
11:00 am	8.70%	7.85%	2.78	6.46%	6.28%	2.10	← Wireline second highest call volume and second highest minutes.
12:00 pm	7.38%	6.57%	2.74	6.07%	5.72%	2.05	
1:00 pm	7.71%	7.38%	2.94	7.45%	7.58%	2.21	
2:00 pm	7.84%	7.31%	2.87	7.78%	8.57%	2.39	
3:00 pm	8.58%	7.74%	2.77	8.64%	8.42%	2.12	
4:00 pm	8.15%	7.51%	2.84	9.15%	9.63%	2.29	← Cellular peak minutes and second highest call volume.
5:00 pm	6.53%	6.80%	3.20	9.91%	8.68%	1.90	← Cellular peak call volume and second highest minutes.
6:00 pm	5.84%	6.49%	3.42	6.34%	6.14%	2.10	
7:00 pm	4.42%	5.95%	4.14	4.57%	3.99%	1.89	
8:00 pm	3.17%	4.37%	4.25	4.24%	4.99%	2.56	
9:00 pm	2.01%	2.85%	4.36	3.76%	4.08%	2.36	
10:00 pm	1.53%	2.39%	4.81	1.81%	2.13%	2.56	
11:00 pm	0.75%	1.21%	4.90	0.67%	0.74%	2.40	
Other Hours	5.52%	4.28%	2.37	5.75%	5.52%	2.08	
Total	100.0%	100.0%		100.0%	100.0%		

TAB 5

The LEC Interstate Access Charge Arbitrage Argument is Without Merit

- Several LECs have attempted to use the specter of access charge arbitrage to divert attention from the procompetitive effects of bill and keep. They have argued that CMRS interconnection reform will create new opportunities for arbitrage that the LECs cannot prevent or police.
- Arbitrage is not a new issue. There is currently — and has long been — a disparity between IXC access and cellular interconnection rates. The Commission has more than adequate tools to address arbitrage if the Commission believes it to be a significant potential problem.
- It is demonstrably untrue that carriers can not prevent arbitrage. The LECs have entered into 1996 Act landline interconnection agreements that fully protect them from any disparity that may exist between interstate access charges and more cost-based interconnection rates. These arrangements demonstrate the LECs' ability to safeguard their interstate access revenues through contractual provisions that specify local calling areas and define local traffic. The LECs thus have not proved that any serious arbitrage issue exists.
 - Interconnection agreements reached by at least 3 BOCs require that local interconnection traffic be identified by the CLEC and that local calling areas be specifically defined.^{1/}
 - Interconnection agreements reach by BOCs also provide for joint monitoring and auditing of traffic to reveal any impermissible arbitrage efforts.^{2/}
 - Where the competitor found such network configurations efficient and the parties agreed, separate trunking groups have been established to more clearly identify traffic.^{3/}

^{1/} See Master Interconnection Agreement between BellSouth Telecommunications, Inc. and Time Warner Communications, § 5.01(e) (Bell South Agreement); Interconnection Agreement Between Ameritech Information Industry Services and MFS Intelnet of Illinois, Inc., § 5.1 (Ameritech Agreement); Interconnection Agreement Between Bell Atlantic - Virginia, Inc. and Jones Telecommunications of Virginia, Inc., § VI (B)(1) (Bell Atlantic Agreement).

^{2/} See Ameritech Agreement §§ 6.1-6.2.2; Bell Atlantic Agreement § VI (E)(1); BellSouth Agreement, § 4.08.

^{3/} See Ameritech Agreement §§ 5.3, 6.0, 7.3.

- The proper interim solution to the potential for arbitrage between CMRS and interexchange access rates is to impose access rates on any traffic delivered to a LEC for termination if it has been received by the CMRS provider from an IXC outside the CMRS provider's service area. CMRS providers will then report this traffic to the LEC and can certify compliance with the Commission's access charge regime. The longer term solution, as the FCC has recognized, is reform of interstate access charges.
- The Commission has the full panoply of enforcement powers to penalize willful violation of this interim certification arrangement.
- The purported adverse effects of arbitrage presume that certification of compliance with the Commission's current access charge regime will fail. There is no evidence that carrier auditing and certification and Commission enforcement will be ineffective.
- The Commission will shortly undertake access charge reform. The absolute worst result would be to stall meaningful reform in CMRS interconnection because of an unsubstantiated fear that arbitrage of CMRS interconnection might put pressure on access charges.